

ABSTRACT OF THE DISCLOSURE

The present invention is directed to a crystallization apparatus including an illumination system to illuminate a phase shift mask, which converts
5 a light beam from the illumination system into a light beam that has a light intensity distribution of an inverse peak pattern having a minimum intensity in an area corresponding to a phase shift portion of the phase shift mask. The crystallization apparatus
10 further includes an optical member to form on a predetermined plane a light intensity distribution of a concave pattern, which has a light intensity that is minimum in an area corresponding to the phase shift portion and increases toward the circumference of that
15 area based on the light from the illumination system, and an image-forming optical system to set a surface of the polycrystalline semiconductor film or the amorphous semiconductor film or its conjugate plane and the predetermined plane to an optical conjugate
20 relationship.